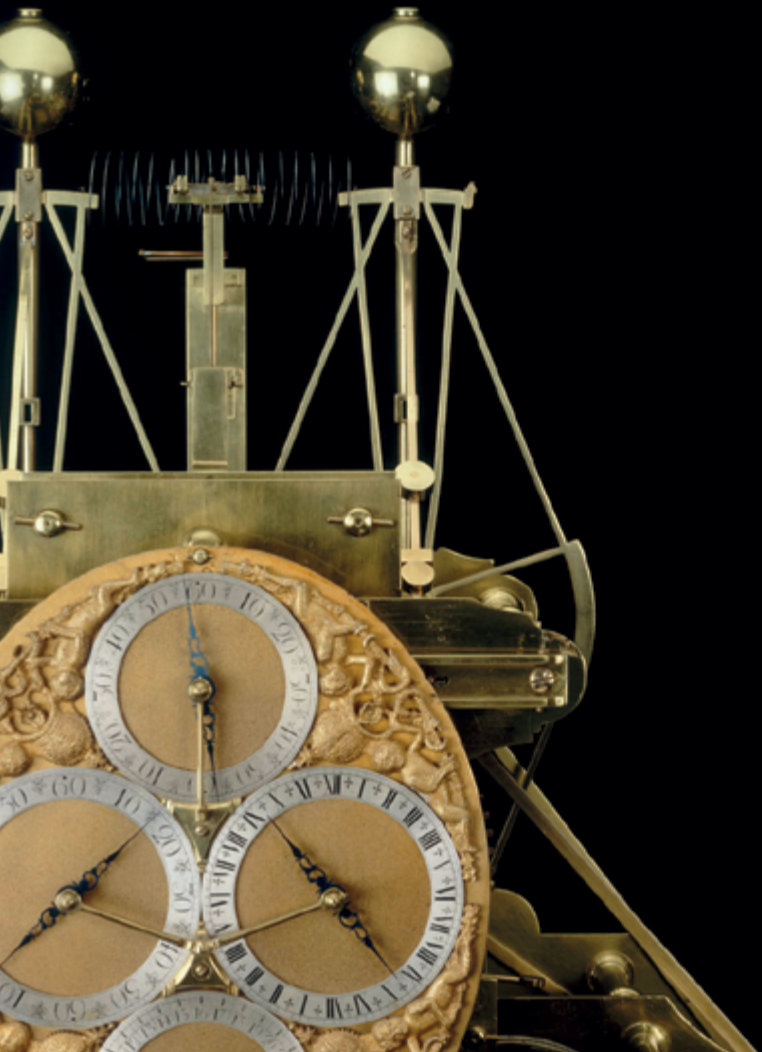
Nesta...

Centre for Challenge Prizes

CHALLENGE PRIZES LANDSCAPE REVIEW



WHAT IS A CHALLENGE PRIZE?

Q: What do the following have in common: margarine, precision clocks, commercial spaceflight and plastics?

A: They were all developed with the help of challenge prizes.

Challenge prizes, also called 'inducement' prizes, offer a reward to whoever can first, or most effectively, meet a defined challenge. They act as an incentive for meeting a specific challenge, rather than an award for past achievements (prizes that do this are referred to as 'recognition' prizes). Famous examples of challenge prizes include the Ansari X-Prize for manned private spaceflight, the 18th century Longitude Prize to help British navigators, or the 20th century Schneider Trophy for aviation, which inspired the Spitfire.

PRIZE MONEY
(Adjusted to 2012 value)

- £0 to £99,999
- £100,000 to £999,999
- £1 million to £9,999,999
- £10 million+

1567
Spanish Longitude Prize

1714
British Longitude Prize

1734-1761
Premium for an Invention to stop the progress of fires

Past experience and extensive research shows that challenge prizes can:

- Attract new innovators to meet a challenge and harness fresh thinking.
- Focus attention and effort on challenges that have been neglected, or that have proved difficult to solve through mainstream research efforts.
- Capture public imagination and generate widespread interest in a new field of endeavour.
- Foster innovation in a wide range of different sectors. Prizes have focused on traditional technological challenges like spaceflight, multifaceted issues like global security, and social issues such as community energy use.
- Encourage dramatic advances by setting ambitious goals.
- Generate commercial activity.
- Limit financial risk by awarding a prize only when the challenge is successfully met.

Challenge prizes can be particularly effective when a goal can be defined in concrete terms, and the means for achieving that goal are unknown or too speculative for a traditional research programme, grant programme or procurement.

1795-1810
Napoleon's Preservation Prize

1823-1827
Turbine Prize

1829
Army Corps of Engineers Navigable River Prize

THEN AND NOW

Offering cash prizes to incentivise breakthrough innovations is a time-honoured practice.

As early as the 18th century, cash prizes were spurring breakthroughs from food preservation during war time to accurate marine navigation, and later from margarine to the commercial hydraulic turbine. Indeed, prizes were so important as a means of spurring technological development that American campaigners launched a sustained effort to replace the US patent system with prizes in the 1850s.

Prizes stimulated whole new industries. When Charles Lindbergh became the first pilot to fly non-stop from New York to Paris winning the Orteig prize in 1927, his celebrity transformed the aviation industry. The number of US passengers increased thirty-fold in three years, while applications for pilot licenses increased 300 per cent. But as technological innovation increasingly became the domain of universities and corporate labs, prizes fell out of favour.

Today, the practice of using prizes to stimulate innovation is back.

As open and collaborative innovation becomes the norm, rather than the exception, and as internet and social platforms offer unprecedented opportunities for collaboration, a new landscape of challenge prizes is emerging. A recent report by McKinsey & Company found that before 1991, 97 per cent of the prize money offered took the form of recognition prizes for past achievements. Since then, 78 per cent of new prize money has been offered for the future solution of problems.

1829
Liverpool and Manchester Railway Locomotive Prize

1852
Substitute for Guano Prize

1863
The Billiard Ball Prize

THE RESEARCH

In parallel with a growth in practical application of prizes over the past ten years, there has been a growing interest from academics in researching how prizes work. The research suggests that prizes can be a good incentive for innovation under many conditions, and can be particularly appropriate where there is market uncertainty. Evidence also suggests that prizes encourage greater risk taking. Recent research has suggested that that innovators may be influenced as much by the prestige of a prize as the size of the prize purse, and has also found that winning solutions can be far more likely to come from outside of the discipline most obviously connected to the challenge.

But many important questions remain unanswered. Researchers and practitioners around the world are continuing to develop a more sophisticated and evidence-based understanding of how to make challenge prizes work as effectively as possible, including by taking advantage of the rich data generated by online platforms.

A reading list can be found on page 13.

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1869
Napoleon III butter substitute prize

1913-1931
Schneider Trophy

1919-1927
The Orteig Prize

RECENT PRACTICE

There has been a significant growth in the number of challenge prizes and competitions launched over recent years. This timeline illustrates some recent examples.

PRIZE MONEY
(Adjusted to 2012 value)

- £0 to £99,999
- £100,000 to £999,999
- £1 million to £9,999,999
- £10 million+

1981-1991
Armand Hammer Cancer Prize

1994-1997
The Super Efficient Refrigerator Programme

1994-1999
Rockefeller Foundation Prize for Rapid STD Diagnostic Test

1996-2004
Ansari X-Prize

1999-2011
Saltire Prize

1999-2005
The China Energy Efficient Refrigerator Programme

2003-2007
DARPA Grand Challenge

2003
The Nirmal Gram Puraskar

2004
NASA Centennial Challenges

From 2005
Global Security Challenge

From 2005
Shell Springboard

2005-2007
The Grainger Prize

2006
Archon X-Prize for genomics

2006-2011
Prize4Life Biomarker Challenge

2007
Virgin Earth Challenge

2007
Google Lunar Prize

2009
Netflix

2007-2009
Big Green Challenge

2009
PayPal X Developer Challenge

2009-2010
100% Open Orange Challenge

2010
NHS Innovation Challenges

2010
Design for Future Climate: Adapting Buildings
Technology Strategy Board
Driving Innovation

2011
Social Innovation Competition for Naples

2011
Water Design Challenge

2012
Buy Better Together (Co-operatives UK)

2012
Blue Hat Prize

The rapid growth in numbers of challenge prizes and challenge-based innovation programmes has brought with it an increase in experimentation with the challenge prize model

Some of the most recognisable approaches include:

Mega-scale prizes – Exemplified by the high profile $10 million Ansari X-Prize for the creation of a private reusable passenger space aircraft, awarded in 2004. The massive success of this project, which leveraged private investment in multiples of the prize purse has led to other X-Prizes, including for sequencing human genomes and in health diagnostics.

Grand challenges – Addressed in a range of ways, from the Gates Foundation's Grand Challenges Explorations programme where $100,000 grants are awarded twice a year to foster innovation in global health research, and followed by up to a $1 million if successful, to NASA's centennial challenges designed to drive progress in space exploration.

But there is a growing range of other challenge prize approaches within, and in addition to, these examples.

Whilst challenge prize approaches can look similar at first glance, they can sometimes vary in quite fundamental ways in the detail of their design, for example in:

- What stage innovations are required to reach, for example, ideas, working prototypes, measurable impact.
- The scale and nature of the prize (financial, non-financial or a combination).
- The specificity of the challenge.
- The balance between measurable and qualitative judging criteria.
- Scope of eligibility criteria.
- Whether the prize is first past the post or performance over time.
- Whether the prize is delivered through a stage approach.
- Whether support is offered to prize entrants.

In recent years there has also been a growing number of solution marketplaces designed to support people to pose challenges and receive solutions from respondents worldwide. Examples include:

- InnoCentive.com
- Challenge.gov
- Maker.Good.is
- OpenIDEO.com
- Kaggle.com
- Changemakers.com

Governments are embracing the potential of challenge prizes to save money and access more radical solutions at a time of severely restricted spending

The US Government has embraced challenge prizes as a means of driving innovation and open government:

- In 2009, the Strategy for American Innovation called for all federal agencies to use prizes and challenges to promote and harness innovation. In March 2010, the Whitehouse issued a government-wide memorandum on the use of challenges.

- As part of the strategy, the US Government has also created Challenge.gov, an online challenge platform that empowers the US Government and the public to bring the best ideas and top talent to bear on the nation's most pressing challenges.

- NASA has recently announced the formation of the Center of Excellence for Collaborative Innovation (COECI). COECI aims to speed up the US Government's adoption of new models of problem solving such as challenge prizes, crowdsourcing and open innovation.

In the UK and Europe:

- In 2008, the Scottish Government launched the £10 million Saltire Prize for innovation in the field of renewable marine energy.

- In 2009, the UK Government announced a £5 million 'Composites Grand Challenge' – administered by the TSB in three parts (feasibility, development and final prize) – to develop innovative composite manufacturing techniques for high-performance, high-value products. The £5 million prize was awarded in 2010 and matched by the winning consortium.

- The UK Department for Business, Innovation and Skills (BIS), as part of their Innovation and Research strategy, is investing in a prize fund to run inducement prizes to spur innovation.

- The European Commission is also showing an interest in challenge prizes, for example they recently announced they will launch a 'European Social Innovation Challenge' in memory of Diogo Vasconcelos, to encourage new social innovations from all over Europe.

Nesta's experience of challenge prizes began in 2007 with the design and launch of the Big Green Challenge. The prize ran over two years, and offered a £1 million prize to the community-based groups who could have the biggest demonstrable measurable reductions in CO_2 emissions in a community. Finalists achieved CO_2 reductions of 10-46 per cent in just one year. Set against the context of the UK target of a 34 per cent reduction on 1990 levels by 2020, this was a significant achievement. The prize was staged and offered support to participants.

WHAT NEXT FOR CHALLENGE PRIZES?

The widespread interest in challenge prizes in the UK and around the world is welcome. It also raises a challenge of its own:

- What needs to happen to make sure that challenge prizes fulfil their potential as transformative tools to encourage innovation?
- What lessons can be learnt from existing prizes – successful and unsuccessful?
- How can this inform the design of new prizes?

These questions provide the driving force for a new Centre for Challenge Prizes establisted by Nesta with the Department for Business, Innovation and Skills.

A CENTRE FOR CHALLENGE PRIZES

The Centre for Challenge Prizes will:

- **Act as a hub for expertise and insight on challenge prizes**
  The aim of this is to generate and share learning and insights on the design and use of challenge prizes. Examples of activities include setting up a practitioner group; developing and contributing to research projects with UK and international partners; running relevant events and group discussions.

- **Design and run new examples of challenge prizes**
  We expect that new prizes we run will focus on awarding prizes based on results – working prototypes or measured outcomes. We expect to run prizes on a range of topics with a range of partners, with a view to learning lessons on prize design and furthering Nesta's charitable objectives in relation to innovation. We will also work with partners to guide or contribute to the design of challenge prizes.

In both aspects of the Centre's work, Nesta is seeking to work with a range of partners, including those experienced in challenge prizes and those newly interested them.

For more information about the Centre for Challenge Prizes see **www.nesta.org.uk/challengeprizes**

To discuss working with Nesta to share experiences and evidence of prizes, or to express interest in partnering with Nesta on a challenge prize, please contact **challengeprizes@nesta.org.uk**

READING LIST

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See: www.innocentive.com/seekers/innovation-case-studies

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Page 5 – Schneider Trophy Contest programme, courtesy of the Science & Society Photo Library.

Page 5 – The Orteig Prize, photo of Charles Lindburgh and the 'Spirit of St Louis', courtesy of Detlev van Ravenswaay/Science Photo Library.

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